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ON THE ARTICLE BY L. A. ROSSOVSKIY, A. I. SHOSTATSKIY
AND L. S. ZIL'BERFARB, "CONCERNING CERTAIN CON-
CEPTS IN THE WORKS OF K. A. VLASOV AND THEIR
ROLE IN PROSPECTING FOR AND EVALUATING
RARE METAL PEGMATITES

By A. A. Beus

- USSR -

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[Following is the translation of an article
by A. A. Beus entitled "Po Povodu Stat'i L.
A. Rossovskogo, A. I. Shostatskogo i L.S.
Zil'berfarba "O Nekortorykh Polozheniyakh v
Rabotakh K. A. Vlasova i ikh Roli pri Poiskakh
i Otsenke Redkometal'nykh Pegmatitov" (English
version above) in Izvestiya Akademii Nauk SSSR,
Seriya geologicheskaya (News of the Academy of
Sciences USSR, Geology Series), No. 4, Moscow,
1960, pages 115-117.]

The article by L. A. Rossovskiy, A. I. Shostatskiy
and L. S. Zil'berfarb, published in "Izvestiya AN SSSR,
Seriya geologicheskaya" (News of the Academy of Sciences
USSR, Geology Series), No. 11, 1959, was a criticism of
K. A. Vlasov's concepts on the properties, texture and
composition of the rare metal pegmatites (6, 7, 8, 9)
and lays claim to an innovation in presenting the problem
of the occurrence of albitization and the mineralization
of the rare metals in undifferentiated pegmatites which
is connected with this. The authors criticized K.A.
Vlasov's views from the standpoint of their applicability
to prospecting for rare metal pegmatites.

These statements in the article are not based on the facts. Moreover, the authors disclose a superficial knowledge of the literature on pegmatites. Not one of the notions which they have advanced is new, and the critical remarks attest to an ignorance of the history of exploiting rare metal pegmatite deposits and to a meager acquaintance with the industrial deposits of rare elements in pegmatites and the demands which have been made of them.

At each historical stage in the working of deposits of one mineral or another, the manner of evaluating them has been primarily determined by industrial requirements made of the given kind of mineral. The evaluational criteria have never been rigid constants and change according to the variations in industrial qualitative requirements for the mineral raw material. This concept can be especially vividly illustrated by the instance of rare element deposits, the need of which has changed particularly sharply during the past few years in connection with the vigorous development of modern technology. Let us take just the case of beryllium which has repeatedly been mentioned by the authors of the critical note. Until most recently, as it is known, industry throughout the world has used principally macrocrystalline beryl gotten from zonal pegmatites. It is from this viewpoint that K. A. Vlasov's classification, which was published 14 years ago, has played and is still playing an important positive role in promoting the search for and utilization of rare metal pegmatites in the USSR.

In order to objectively appraise the significance of this classification, it should not be forgotten that differentiated substitution rare metal pegmatites have produced in countries of the capitalist camp to date up to 90 percent beryllium concentrate yields and 100 percent tantalite yields. The beryllium concentrate derived from zonal pegmatites by picking without using special concentration methods continues to remain the cheapest kind of beryllium raw ore.

It has notwithstanding become quite apparent in the past decades due to the sharp increase in worldwide demand for beryllium raw material that growing industrial requirements cannot be satisfied within the near future solely on the basis of cheap macrocrystalline beryllium ores. It is precisely for this reason that a number of experts who have been studying rare element deposits (including the author of this present article) have initiated the trend among our geologists to explore not only macrocrystalline beryllium occurrences, but deposits of

fine crystalline beryllium ores associated with different groups of replacement pegmatites and greisens as well (1, 3, 4).

It was essential to develop and add to the established exploratory criteria, as had been done in a number of works which have appeared in recent years (1, 3, 4 and 10). Quite naturally these supplements do not by any means eclipse the importance of seeking out commercial grade deposits of the most easily mined and cheapest beryllium and tantalite ores associated with substituted, well differentiated pegmatites.

It is most regrettable that rare element deposits associated with substituted zonal pegmatites have not been located within the borders of Pamir. This does not however justify paying no heed to large commercial deposits of this type which are known in other parts of the globe.

It should be noted that not one of the deposits of fine-crystalline beryl in albitized pegmatites on the earth has yet been worked, despite the fact that with favorable economic conditions, a good beryllium oxide content (more than 0.05%) and significant reserves (over 1000 tons of BeO), such deposits will soon take on practical significance (4).

Turning to tantalum, it must also be said that although tantalite may be encountered as a mineral in all complexes of the pegmatites which are subjected to strong albitization (11), its commercial deposits characterized by high tantalum pentoxide contents are at present known only in intensely replaced zonal pegmatites.

As one-sided as the criticism of K. A. Vlasov's views have been in this article, just as correctly emphasized is the beneficial role of massive crystalline intrusive rocks in locating large pegmatite deposits. It should however be regretted that the authors of this article do not know that the largest commercial pegmatitic occurrences of lithium, beryllium, cesium and to some extent tantalum in various parts of the globe are connected with pegmatites which occur in bed rock fissures. This does not, quite naturally, exclude the fact commercial deposits of the rare-earth elements in pegmatites can be associated with bodies which lie in shales (which, by the way, absolutely no one ever denied). Nevertheless, it is possible to contend that the examined concepts of K. A. Vlasov "contradict observed facts" only when one is not acquainted with pegmatite deposits.

It may be hoped in this particular case that the authors of the critical article will in the future draw

their conclusions about the applicability of some specific prospecting criteria on the basis of an analysis of extensive material covering actual commercial deposits in various regions, rather than building their criticism on data from a limited number of ore occurrences whose minable value has neither been proven or approved as yet.

At the conclusion of their article, L.N. Rossovskiy, A. N. Shostatskiy and L. S. Zil'berfarb have expressed a number of unfounded observations about the author of this present article.

To pass judgment on A. A. Beus' views on the origin of substitution pegmatites and the geochemical connection between beryllium concentration and the replacement processes, there is no need to refer to the work "Beryllium" (an evaluation of deposits in prospecting and exploring) (1) where genetic problems have not at all been treated. These questions are examined in the work "The Geochemistry of Beryllium in Granitic Pegmatites", published in 1957 (2). Were the authors of the critical article to become acquainted with this work, they might just possibly not distort my views on the origin of substitution pegmatites. If they were to read through the already cited work "Beryllium" (1) somewhat more attentively, as well as taking the trouble to acquaint themselves with the slightly later methodological directions in the reconnaissance of deposits of beryllium, tantalum and columbium (3) they might just have avoided coming out with the erroneous statement, "The replaced medium-grained pegmatites with finely disseminated rare metal mineralization, including fine beryl crystals not discernible with the naked eye, have not been at all considered by A. A. Beus".

Information on the occurrence of finely crystalline beryl, associated with the albite replacement zone, in substituted muscovite-albite pegmatites can be found by L. N. Rossovskiy and the others in the work "Beryllium" (page 68). In this same work the prospecting value of albitization independent of the degree of differentiation in the pegmatite has often been mentioned (pages 68, 112, 116 and others). In methodological guide to exploring deposits for beryllium, tantalum and columbium published in 1957 (3) it has been stated quite explicitly that in commercial beryl deposits occurring in substituted muscovite-albite pegmatites up to 70 percent of the beryl is represented by fine crystals, the extraction of which requires special concentrating methods (pages 23, 24). This is what has been said about evaluating albitized

beryl-bearing pegmatites in the handbook designated for prospecting and reconnoitering geologists, "At the same time the evaluation of albitized pegmatites should be made according to the extent of albitization. Texture is not of decisive significance in evaluating albitized pegmatites. It should be noted that all large commercial deposits of beryl in pegmatites are associated with albitized pegmatites, which automatically points out the great importance of albitization as a guiding prospecting indicator" (4, page 21).

In conclusion it must be noted that both K.A. Vlasov's concepts (5-8) (naturally, if they are correctly applied) and the recommendation of A. A. Beus (1, 2, 3, 4) direct geologists precisely to exploring substituted rare metal pegmatites. It is therefore difficult to say on what basis L. N. Rossovskiy, A. N. Shostatskiy and L. S. Zil'berfarb have come to the absolutely false conclusion that K. A. Vlasov's concepts and A.A.Beus' recommendations are valid only for the unsubstituted beryl-muscovite pegmatites. Such statements can only be interpreted by insufficient acquaintance with the literature and the factual material extant on the considered problem.

It may be hoped in the future that the authors would describe in detail the pegmatites which have to date been scarcely known. Without any doubt, were they to succeed in substantiating prospecting criteria for commercial deposits of rare metal pegmatites which differ qualitatively from existing standards, these criteria will be accepted with thanks by our geologists working in this field.

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